

REMARKS

This application has been carefully reviewed in light of the Office Action dated October 4, 2007. Claims 1-4, 7-19 and 23-38 remain in this application. Claims 1 and 23 are the independent Claims. Claims 1 and 7 have been amended. Claims 5-6 and 20-22 have been cancelled without prejudice. Claims 23-38 are the New Claims. It is believed that no new matter is involved in the amendments or arguments presented herein. Reconsideration and entrance of the amendment in the application are respectfully requested.

Art-Based Rejections

Claims 1-5 were rejected under 35 U.S.C. §103(a) over U.S. Patent No. 6,555,406 (Leung) in view of U.S. Publication No. 2003/0020501 (Aoki); Claims 6-7 were rejected under §103(a) over Leung in view of Aoki; Claims 8-19 were rejected under §103(a) over Leung in view of Aoki. Applicant respectfully traverses the rejections and submits that the claims herein are patentable in light of the clarifying amendments above and the arguments below.

The Leung Reference

Leung is directed to a method of manufacturing photonic band gap structures operable in the optical spectrum. Leung discloses a multi-layer structure having a number of dielectric rods is that obtained by filling a ceramic bearing materials into channels of a polymer structure to form a ceramic and polymer structure and heating the ceramic and polymer structure to decompose the polymer to create the multi-layer structure (*See, Leung, Abstract; Claim 1*).

The Aoki Reference

Aoki is directed to a three-dimensional photonic crystal, and a process for the production thereof as well as a probe used therefore. Aoki discloses a two-dimensional photonic crystal (corresponding to the first or second composite dielectric of the present invention) that is obtained by crystal growth, fabrication of mask, drawing and etching, (See, *Aoki, Abstract, [008]*). Aoki discloses a lamination method wherein a microsphere being a spherical body having a corresponding dimension to a through hole is fitted into the through hole arranged on a frame of a two-dimensional photonic crystal plate to locate the microsphere therein by the use of a probe in accordance with a micromanipulation method (See, *Aoki, Col. 4, Paragraphs 0057-0064*).

The Claims are Patentable Over the Cited References

The present application is generally directed to a method for producing a photonic crystal.

Claim 1

As defined by amended independent Claim 1, a method for producing a photonic crystal in which a first dielectric and a second dielectric different in relative dielectric constant from the first dielectric are periodically arrayed, is provided. The method includes the steps of fabricating a first composite dielectric in which the first dielectric and the second dielectric are periodically arrayed in one and the same plane. A laminating step on the first composite dielectric a second composite dielectric is provided in which said first dielectric and said second dielectric are periodically arrayed in one and the same plane. The first composite dielectric and said second composite dielectric are obtained by use of a printing technique.

The applied references are not seen to disclose or suggest the above features of the claims of the present invention. In particular, the applied references are not seen to disclose or suggest "said first composite dielectric and said second composite dielectric are obtained by use of a printing technique," as required by amended independent Claim 1.

Leung teaches that a multi-layer structure having a number of dielectric rods is obtained by filling a ceramic bearing materials into channels of a polymer structure to form a ceramic and polymer structure and heating the ceramic and polymer structure to decompose the polymer to create the multi-layer structure (*See, Leung, Claim 1*). However, Leung does not disclose, teach or even suggest "said first composite dielectric and said second composite dielectric are obtained by use of a printing technique," as required by amended independent Claim 1 of the present invention.

Similarly, Aoki teaches a two-dimensional photonic crystal corresponding to the first or second composite dielectric of the present invention, which is obtained by crystal growth, fabrication of mask, drawing and etching (*See, Aoki, Abstract, [008]*). Again, Aoki does not disclose, teach or even suggest "said first composite dielectric and said second composite dielectric are obtained by use of a printing technique," as required by amended independent Claim 1 of the present invention.

Since the cited reference fails to disclose, teach or suggest the above features recited in amended independent Claim 1, these references cannot be said to anticipate nor render obvious the invention which is the subject matter of those claims.

Accordingly, amended independent Claim 1 is believed to be in condition for allowance and such allowance is respectfully requested.

Claim 23

As recited by New Independent Claim 23, a method for producing a photonic crystal in which a first dielectric and a second dielectric different in relative dielectric constant from the first dielectric are periodically arrayed, is provided. The method includes the steps of fabricating a first composite dielectric in which the first dielectric and the second dielectric are periodically arrayed in one and the same plane. Laminating on the first composite dielectric a second composite dielectric by thermocompression bonding in which the first dielectric and the second dielectric are periodically arrayed in one and the same plane is provided. The first composite dielectric and the second composite dielectric are each obtained by perforating holes in a sheet-like member.

The applied references are not seen to disclose or suggest the above features of the claims of the present invention. In particular, the applied references are not seen to disclose or suggest "laminating on said first composite dielectric a second composite dielectric by thermocompression bonding in which said first dielectric and said second dielectric are periodically arrayed in one and the same plane; and said first composite dielectric and said second composite dielectric are each obtained by perforating holes in a sheet-like member," as required by New independent Claim 23 of the present invention.

Aoki discloses a lamination method wherein a microsphere that is a spherical body having a corresponding dimension to a through hole, is fitted into the through hole arranged on a frame of a two-dimensional photonic crystal plate to locate the microsphere therein by the use of a probe in accordance with a micromanipulation method (*See, Aoki, Col. 4, Paragraphs 0057-0064*).

In contrast, Claim 23 requires that lamination be carried out by thermocompression bonding. This requirement is supported by the Specification of the present application, which discloses thermocompression bonding and printing technique as methods to laminate the first and second composite dielectrics. Specifically, the First, Second and Fourth Processes of the present disclosure disclose lamination by thermocompression bonding, while the Third, Fifth, Sixth and Seventh Processes disclose lamination by printing technique in Examples 1 and 4, thermocompression bonding is carried out, while in Examples 2, 3 and 5, printing technique is carried out for lamination. For laminating a sheet-like member with perforated holes, thermocompression bonding is carried out (First and Second Processes and Examples 1 and 4) whereas either printing technique or thermocompression bonding can be carried out to laminate printed composite dielectrics.

Leung does not remedy the above discussed deficiencies of Aoki.

Since the cited reference fails to disclose, teach or suggest the above features recited in New Independent Claim 23, these references cannot be said to anticipate nor render obvious the invention which is the subject matter of those claims.

Accordingly, New Independent Claim 23 is believed to be in condition for allowance and such allowance is respectfully requested.

The remaining claims depend either directly or indirectly from independent Claims 1 and 23 and recite additional features of the invention which are neither disclosed nor fairly suggested by the applied references and are therefore also believed to be in condition for allowance, and such allowance is respectfully requested.

Appl. No. 10/530,068
Amdt. Dated January 3, 2008
Reply to Office Action of October 4, 2007

Attorney Docket No. 81864.0058
Customer No.: 26021

Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4721 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: January 3, 2008

By: 

Dariush G. Adli
Registration No. 51,386
Attorney for Applicant(s)

1999 Avenue of the Stars, Suite 1400
Los Angeles, California 90067
Phone: 310-785-4600
Fax: 310-785-4601